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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/620,346	07/17/2003	Hiroshi Sumi	Q76616	8680
23373	7590	08/22/2006	EXAMINER	
SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			LAM, CATHY FONG FONG	
			ART UNIT	PAPER NUMBER
			1775	

DATE MAILED: 08/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/620,346

Applicant(s)

SUMI ET AL.

Examiner

Cathy Lam

Art Unit

1775

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Nov. 29, 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 and 15 is/are pending in the application.
- 4a) Of the above claim(s) 15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12-13-2005.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

In view of the amendment and Terminal Disclaimer filed on Nov. 29, 2005, the obviousness type double patenting rejection has been withdrawn. The pending claims however continue to be unpatentable as following:

Election/Restrictions

1. Newly submitted claim 15 is directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: claim 15 involves with a method for producing a wiring board which belongs to another class.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claim 15 is withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 112

2. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is vague and indefinite as to what "the conductor layer comprises an inorganic material" is referring to? The examiner is taking the position that the copper powder, the SiO₂ particles and the ceramic particles are all inorganic materials as in claim 1. It is unclear whether or not Applicant is trying to claim an additional inorganic material? Furthermore, it is unclear what "not to be exposed to an outside of the conductor layer" is referring to? Clarification is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 3, 4, 6 and 7 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Kang et al (US 5296189).

Kang discloses a conductive composition comprised of copper particles and alumina particles. The conductive composition is formed into a conductive paste which is screen-printed onto a ceramic substrate to form a printed circuit board. The conductive paste may be filled into via holes of the ceramic substrate or printed onto the surface of the ceramic substrate (col 6 L 40-43 & L 54-56).

The conductive composition that comprised of copper particles having initial particles size of 2 to 5 μm and the alumina particles of 0.05 μm (or 50 nm) in average (col 5 L 43-45 & L 68-col 6 L 1).

The conductive composition further comprises of an organic vehicle and/or binder (col 9 L 39-40).

The prior art is silent about the resistivity of the conductive layer, the examiner is taking the position that since Kang's conductive paste meets the claimed composition, inherently Kang's copper paste possesses the same resistivity.

Kang broadly discloses claim 6, since average size of the alumina particles is 0.05 μm , i.e. < 2 μm . Kang further teaches that such small size alumina particles is for

a more homogenous mixture with the copper power and to reduce interparticle porosities (col 6 L 1-12). This implies that the inorganic particles do not expose outside of the conductor layer.

Regarding to claim 7, Kang teaches a multilayer printed circuit board, and the conductive paste that is formed in the via holes and between the ceramic substrates, the examiner is taking the position that the conductive paste is subjected to a plating treatment (col 6 L 51-56).

5. Claims 8-10 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Powers, Jr. (GB 2033667 A).

Powers teaches a circuit board comprised of a conductive material (14) and an insulating base material (10).

The insulating base material (10) has indentations (12) on its surface(s). The conductive material (14) is filled into the indentations to form a conductive pattern (Fig. 2).

The conductive material (14) is comprised of copper or other metals and alloys; the conductive material (14) is applied to the base material (10) in a molten state (page 1 L 50-53, L 60-64). The examiner is taking the position that Powers' molten (conductive) material contains no particle form.

The conductive material (14) is further plated with a solder material for connecting wires of electronic components (page 2 L 46-49).

Claim Rejections - 35 USC § 102/103

6. Claim 2 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kang et al (US 5296189).

Kang teaches a printed circuit board having a copper paste formed on a ceramic substrate. The copper paste comprised of copper powder, an organic vehicle and a ceramic particle (col 4 L 38-41 & col 9 L 36-40).

The ceramic particle is alumina having an average grain size of 0.05 μm (or 50 nm) (col 5 L 67-col 6 L 1).

Kang further teaches that other inorganic material such as silica (or SiO_2) can be used in place of alumina (col 4 L 35).

In view of the prior art teaching, one skill in the art would substitute alumina with silica by choosing the same particle size as the alumina particles because it gives a more homogeneous copper conductive and reduces interparticle porosities (col 6 L 1-12).

Claim Rejections - 35 USC § 103

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kang et al (US 5296189).

Kang discloses the ceramic substrate that is formed of crystallizable glass particles that are densified to from a green sheet (col 7 L 8-13).


The crystallizable glass particles can include lithium disilicate and/or eucryptite, both of which containing lithium and in the form of an alkali metal oxide (col 9 L 3-20).

Kang is silent about the mol% of the alkali metal oxide in the green sheet. In view of Kang's teaching, one skill in the art would choose a workable amount because it only involves routine experimentation.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cathy Lam whose telephone number is (571) 272-1538. The examiner can normally be reached on 9am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Cathy Lam
Primary Examiner
Art Unit 1775